U.S. DEPARTMENT OF ENERGY





2010 Congressional Nuclear Cleanup Caucus

Hanford Site Office of River Protection Update Richland, Washington

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EM is Embarked on a Journey to Excellence

Our Vision:

"EM completes quality work safely, on schedule and within cost and delivers demonstrated value to the American taxpayer."

EM Mission and Priorities

"Complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and Government-sponsored nuclear energy research."






- Activities to maintain a safe, secure, and compliant posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, processing, and disposition
- High-priority groundwater remediation
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning (D&D)

EM Program Goals

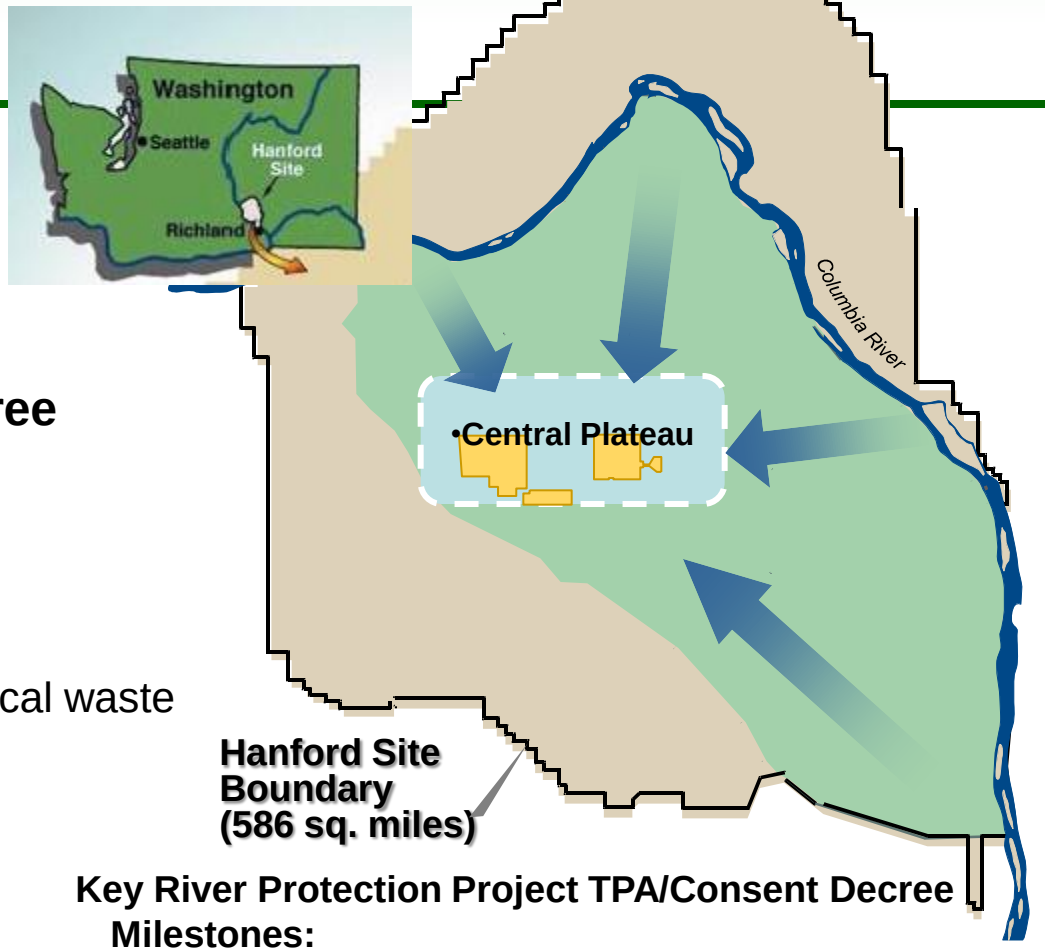
- **Risk Reduction**
  - Ensure the safety and health of the public and the workers
  - Protect the environment
  - Reduce the EM Footprint by 90% by 2015
- **Maintain Compliance**
  - 37 compliance agreements with state and Federal regulatory agencies
  - Complete building the capability for dispositioning tank waste, nuclear materials, and spent nuclear fuel
- **EM American Recovery and Reinvestment Act Goals**
  - Thousands of jobs created or saved
  - Reduce the EM Footprint by 40% by 2011
- **Improve Project Performance**
  - Improve construction project performance
  - Deliver all projects on time and within cost
  - Get EM projects removed from the GAO High-Risk List
- **Establish strategic options for Special Nuclear Materials, Spent Nuclear Fuel, Radioactive Tank Waste, Groundwater and Excess Facilities not currently in the EM portfolio**
  - Overall objective is to reduce life-cycle costs and shorten the period of program execution

EM Strategic Goals

- Improve ***Safety Performance*** with the goal of zero accidents/incidents
- Improve ***Project Management***
  - Restructure the project portfolio
  - Adapt the Office of Science construction project model to EM
    - Construction Project Review, front end planning; appropriate pricing and contingency
  - Establish Performance Metrics for EM operating projects
  - Align project and contract management
  - Streamline the acquisition process
- Achieve ***Excellence in Management and Leadership*** with the objective of making EM an employer of choice in the Federal government
- Align ***Headquarters and Field Operations*** in order to streamline decision-making and improve efficiency
- Utilize ***Science and Technology*** to optimize the efficiency of tank waste, excess nuclear materials, spent nuclear fuel and groundwater treatment and disposition
  - Evaluate programmatic alternatives to smartly reduce the cost of the program and period of execution

River Protection Overview

Retrieve, immobilize and dispose of radioactive and chemical tank waste and close Hanford's Tank Farms



Tri-Party Agreement/Consent Decree Tank Farms

- 177 underground storage tanks
  - –149 Single Shell Tanks (SST)
  - –28 Double Shell Tanks (DST)
- 53 million gallons radioactive and chemical waste
- 194 million curies radioactivity
- 151,000 tons complex chemicals
- TC&WM EIS

Waste Treatment Plant (WTP)

- Design/build
- Operational in 2019
- Treat and immobilize in glass radioactive and chemical tank waste

Key River Protection Project TPA/Consent Decree Milestones:

❑ Retrieve C Farm Single Shell Tanks	2014
❑ Complete WTP Construction, Startup and Commissioning	2019
❑ Retrieve All Single Shell Tanks	2040
❑ Treat All Tank Waste	2047
❑ Complete Mission	2052

Office of River Protection
FY 2011 Congressional Budget Request

	FY2009 ARRA (x$1,000)	FY 2010 Appropriation * (x$1,000)	FY 2011 Request * (x$1,000)
Tank Farm Activities	326,035	408,000	418,000
*Waste Treatment and Immobilization Plant**	-	690,000	740,178
Total, Office of River Protection	326,035	1,098,000	1,158,178
American Recovery and Reinvestment Act		326,000	

* 2 control points – One for Pretreatment Facility and one for Low Activity Waste Facility, Analytical Laboratory, Balance of Facilities, and High Level Waste Facility

Tank Farms: Building on Success

***Left:** Retrieval Preparations*

***Right:** Mobile Arm Retrieval System (MARS)*

***Right:** Demonstration of Ultrasonic testing on Double-Shell Tanks*

***Left:** Proposed TY Interim Surface Barrier Footprint*

American Recovery and Reinvestment Act

Total: $326M Spent to Date: $51.7M Total FTEs: 307

- **ORP Mission Benefits from ARRA:**
- Infrastructure upgrades to complete mission
- Ensure reliable & predictable waste feed for WTP operations in 2019

242-T HEPA filter removal

Tank Waste Mixing

Wiped Film Evaporator

SY-P28 Exhauster removal (lead, asbestos, radioactive material)

- Tank Farm Infrastructure Upgrades (Operating)
- Other Infrastructure Upgrades (Operating)
- Facilities Upgrades (Operating)
- Waste Feed Infrastructure Upgrades (Operating)
- Waste Feed Transfer Lines Upgrades (Capital Asset)

Waste Treatment Plant: Building for the Future

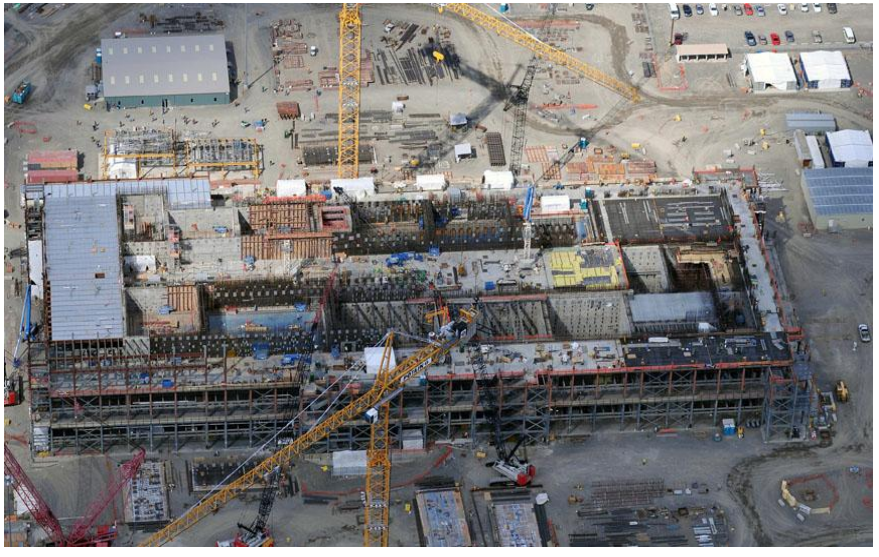
53% Complete

Aerial view

Overall design = 78% complete Overall construction = 49% complete

2,000 Professional Staff 900 Craft Workers 200 Subcontractors ~3,100 Total Staff

Waste Treatment Plant: Building for the Future



Left: ***Pretreatment Facility***

Right: ***Glass Former Silos***

Left: ***Large mixing vessel installed on the north end of Low Activity Waste Facility***

Right: ***Pretreatment Engineering Platform***

Office of River Protection Focus

- River Protection Project
  - Tank Closure & Waste Management Environmental Impact Statement
  - Tri-Party Agreement/Consent Decree
  - Tank waste strategy to accelerate 2040/2047
- Tank Farms
  - Technology Development & Deployment
    - Reduce tank waste life cycle
    - Retrievals
    - Mobile Arm Retrieval System (MARS) deployment
  - ARRA; Reliable, predictable waste feed to WTP
- Waste Treatment Plant
  - Resolve technical issue (M3)
  - Accelerate design/construction focus

Frank Russo, Project Director

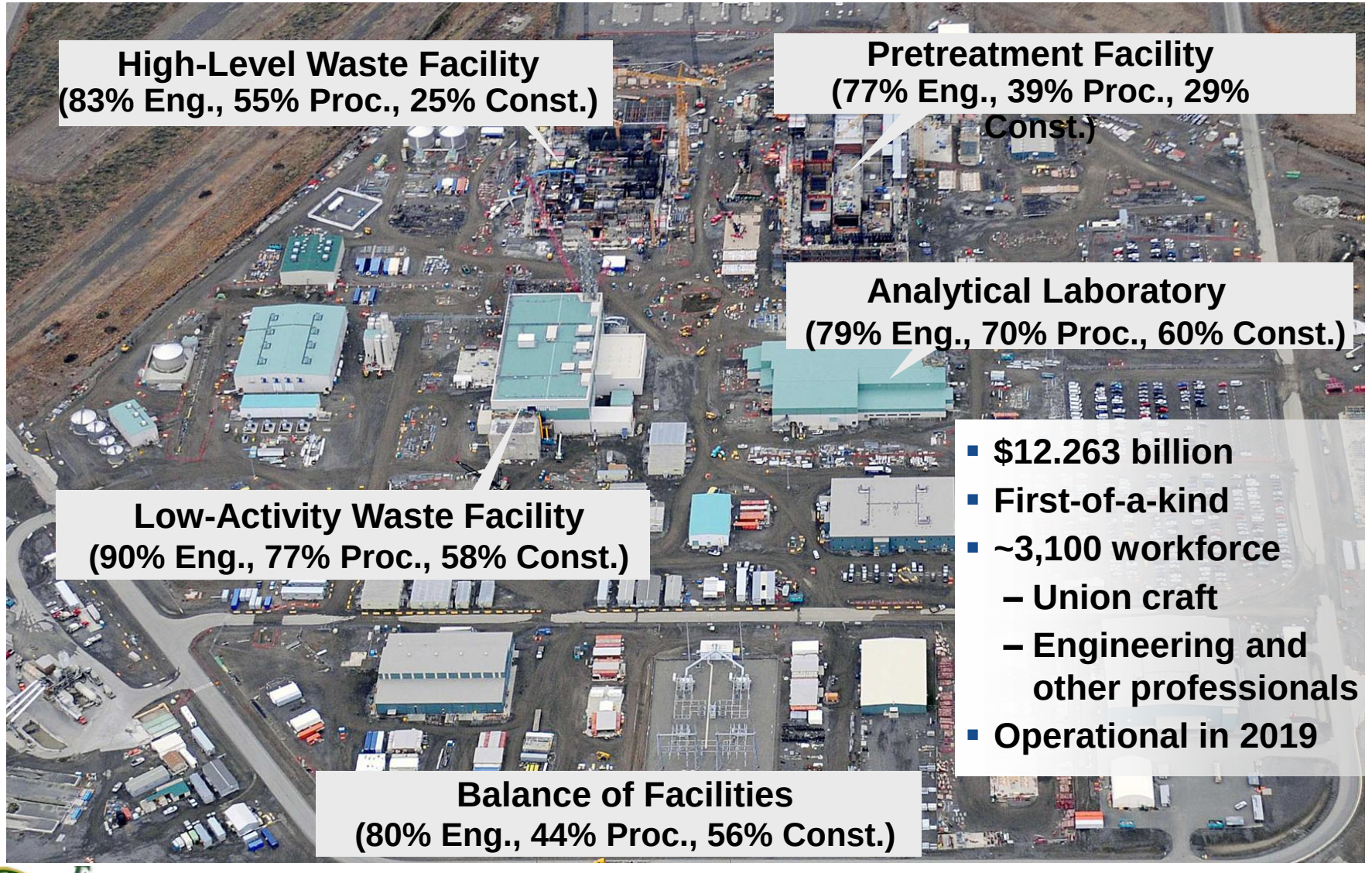
Bechtel National, Inc.

Progress at Waste Treatment Plant

- Total project is now 53% complete
- Plant design is 78% complete
- Procurements more than 50% complete
- Closing technical issues

Pretreatment Facility

WTP is 53% complete



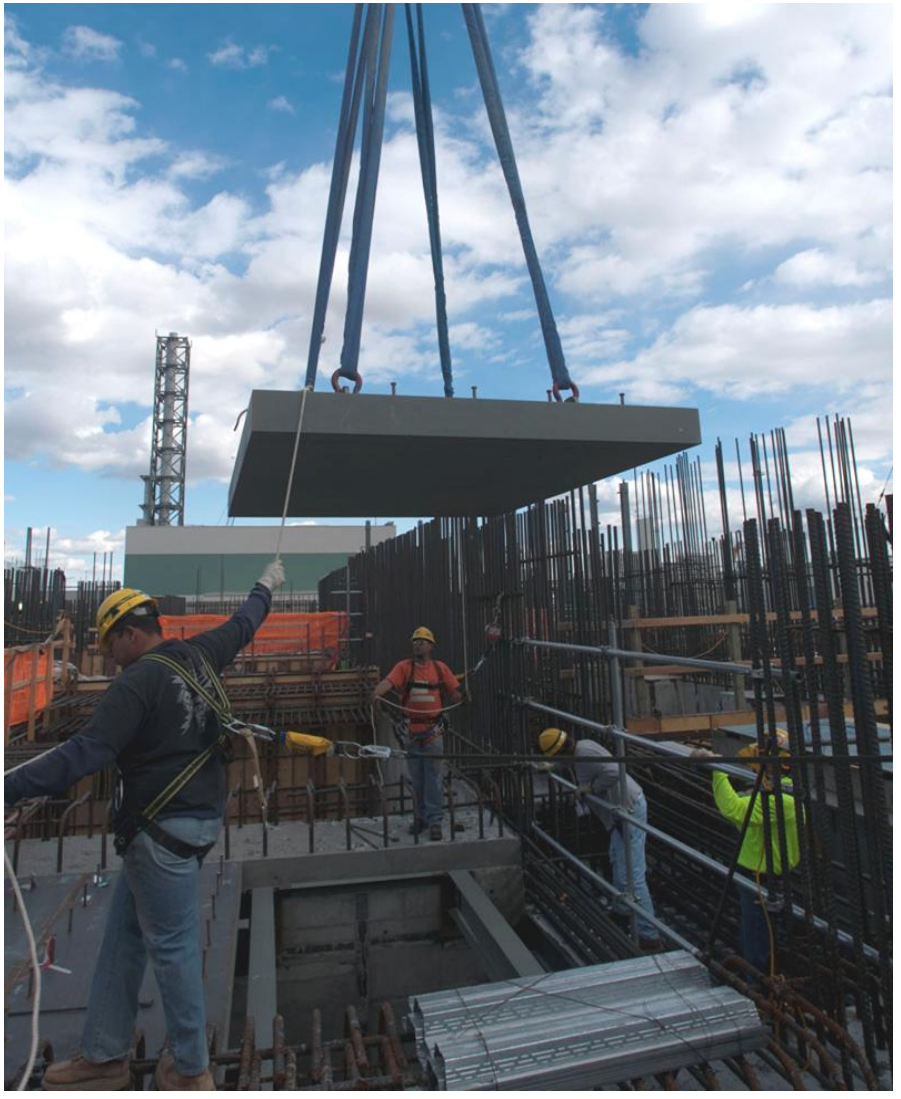
- $12.263 billion
- First-of-a-kind
- ~3,100 workforce
  - Union craft
  - Engineering and other professionals
- Operational in 2019

2009 – Safest Year Ever

Safest year since contract start in 2000

- Behavior-based safety culture
  - Monthly supervisory safety meetings: “Safety Church”
  - Safety Education Through Observation: “SETO” Teams
  - Craft Safety Representatives
- Construction site earned DOE VPP “Merit” status
- Will apply for DOE-VPP “Star” status in 2010

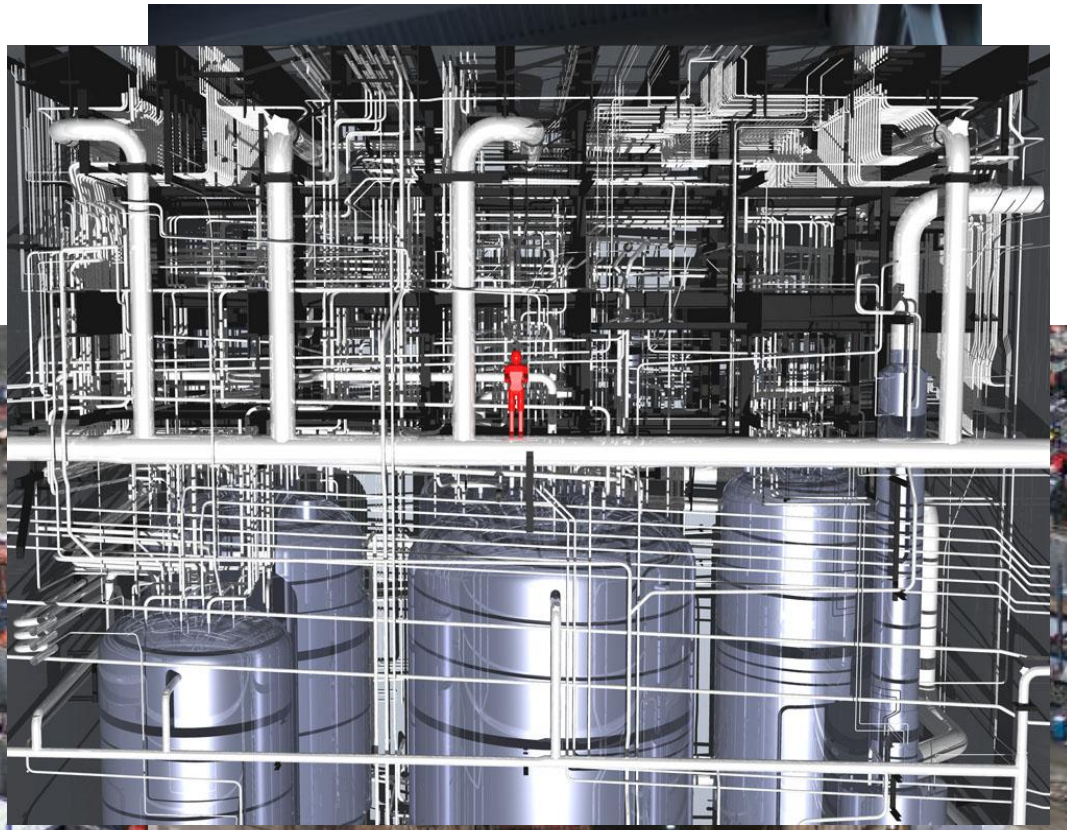
WTP Project



Pretreatment Facility

World's largest radioactive chemical separations facility

- 77% design complete
- 39% procurement complete
- 29% construction complete



High-Level Waste Vitrification Facility

Turns high-level waste into glass

- 83% design complete
- 55% procurement complete
- 25% construction complete

Low-Activity Waste Vitrification Facility

Turns low-activity waste into glass

- 90% design complete
- 77% procurement complete
- 58% construction complete

Analytical Laboratory

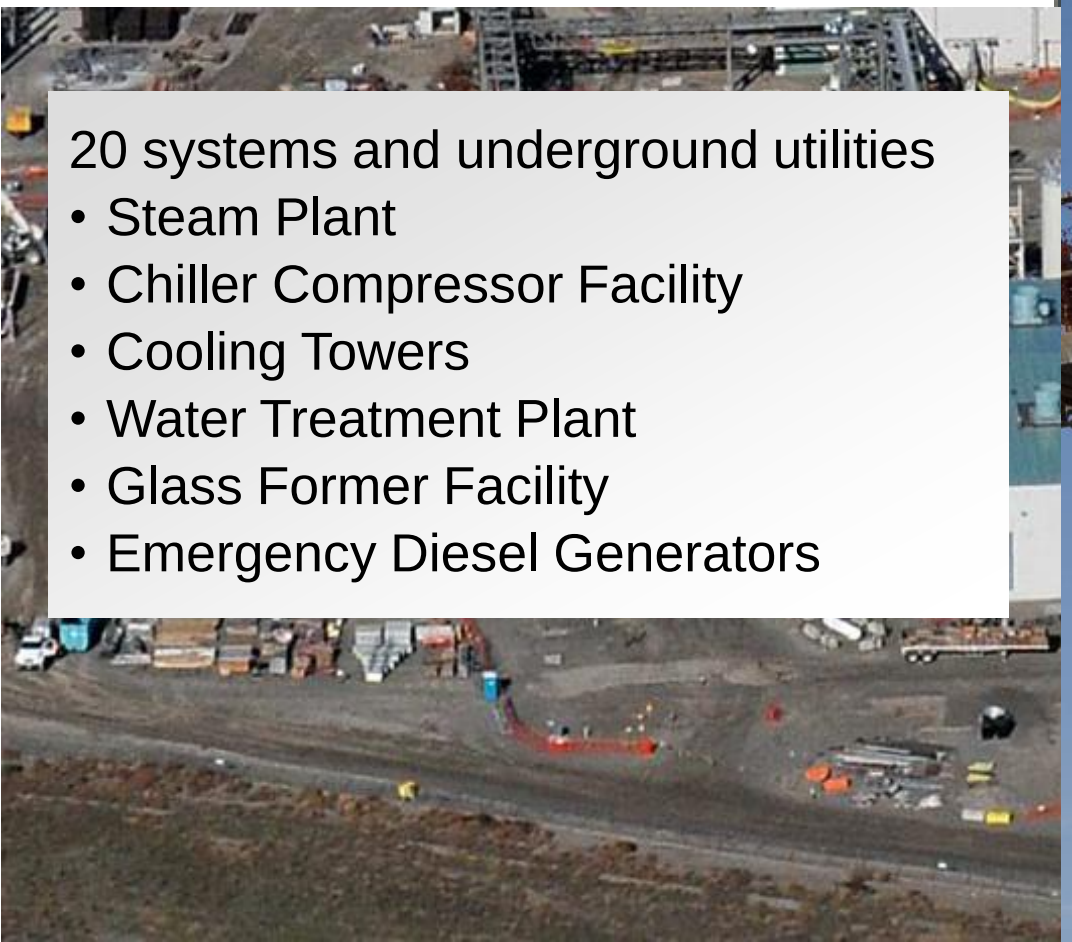
Ensures glass meets regulatory requirements

- 79% design complete
- 70% procurement complete
- 60% construction complete

Balance of Facilities

Vast infrastructure to support operations

- 80% design complete
- 44% procurement complete
- 56% construction complete



20 systems and underground utilities

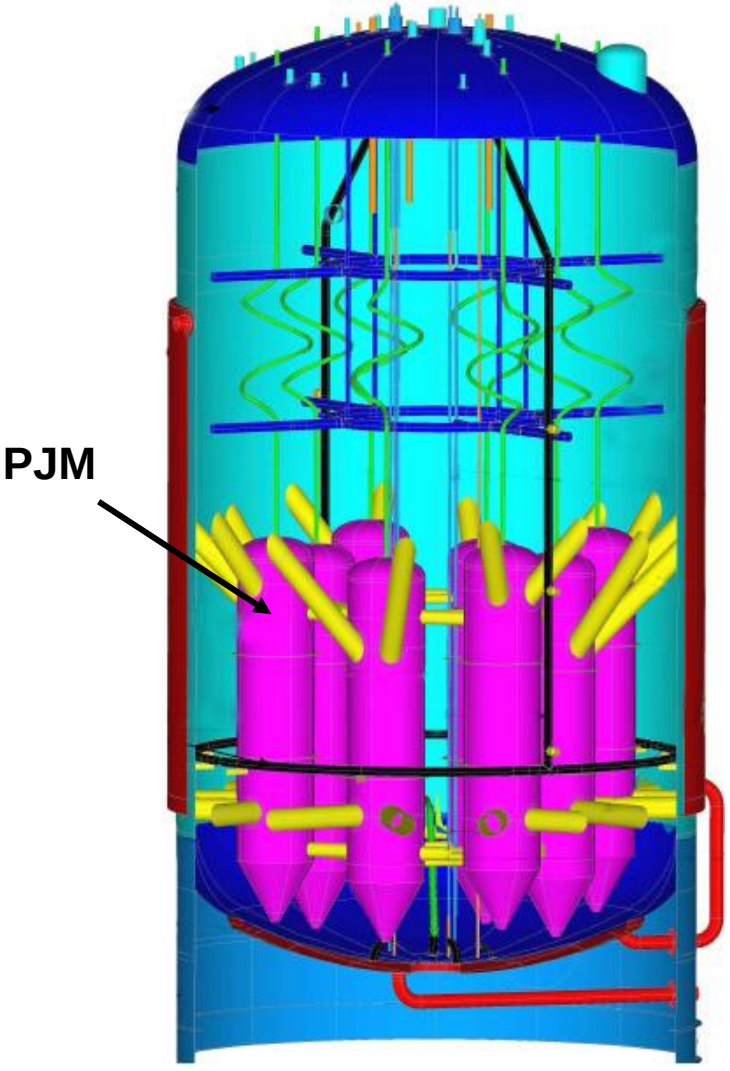
- Steam Plant
- Chiller Compressor Facility
- Cooling Towers
- Water Treatment Plant
- Glass Former Facility
- Emergency Diesel Generators

Resolution of Technical Issues

- Closed 27 of 28 External Flowsheet Review Team (EFRT) issues
  - Adequacy of pulse jet mixing is the only remaining major technical issue

Resolution of Pulse Jet Mixing (PJM) in Vessels (M3)

- Modifications currently being defined
- Closure of PJM issue expected in June 2010



Ultrafiltration Process-1 A/B

2010 WTP Planned Accomplishments

- Close out the M3 mixing technical issue
- Work toward freezing and pin-point acceleration of our design
- Erect High-Level Waste Vitrification Facility Structural Steel up to the 14-foot elevation
  - Tri-Party Agreement milestone
- Complete High-Level Waste Vitrification Facility HVAC design
- Award more than $100 million in procurements and subcontracts
- Reach nearly 60% total project complete
  - 84% design complete
  - 62% procurement complete
  - 56% construction complete

Closely Integrating with Tank Operations Contractor

- WTP and Tank Operations Contractor work closely together to optimize total system
- Defining technical interfaces such as tank waste material delivery specifications
- Using Tank Farm data as basis for WTP safety design to reduce complexity and benefit operations
- Ensuring fully compatible work control systems
- Developing aligned engineering, maintenance and training programs to facilitate turnover
- Sharing technical talent and discussing retention of experienced people

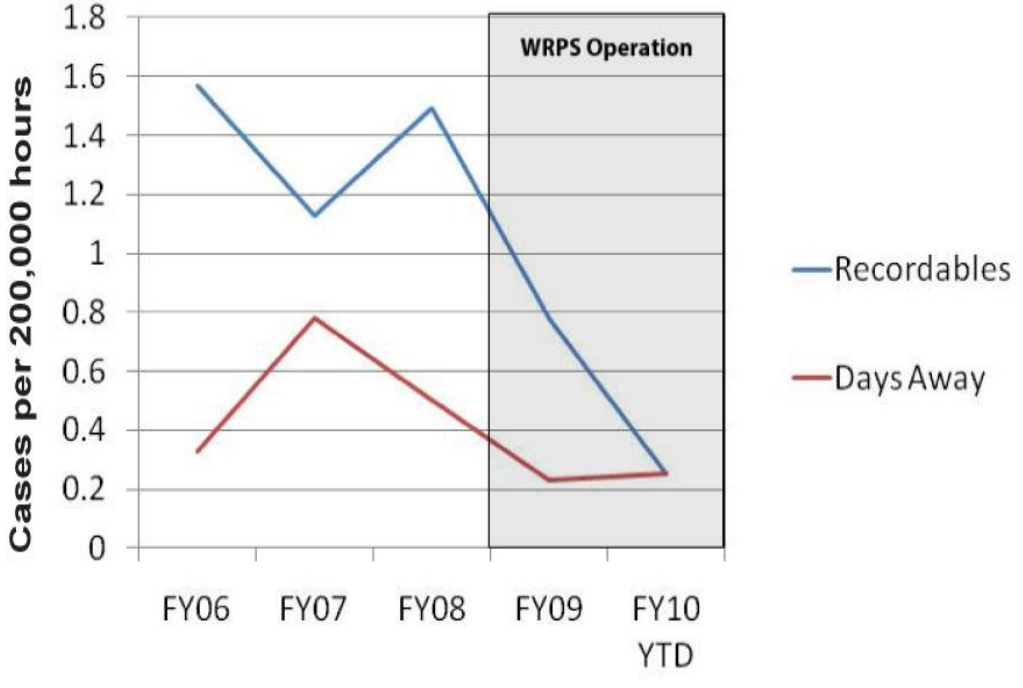
Chuck Spencer
President and Project Manager

Washington River Protection Solutions, LLC

Tank Operations Contract Project Goals

- Do work safely
- Manage legacy waste and necessary infrastructure
- Reduce risks to the Columbia River and the public through retrievals
- Ensure reliable and predictable waste feed delivery system for Waste Treatment Plant operations

Enhancing a Strong Safety Culture



- ~50% or greater reduction in important injury rates in FY-09; continuing to drop in FY-10
- Integrated Safety Management System Phase 1&2 verifications completed
- Implementing chemical ALARA program for worker protection from tank vapors
- Working toward VPP Star status for the entire organization in FY 2010; DOE assessment this summer

Department of Energy VPP

INTEGRATED SAFETY MANAGEMENT SYSTEM — SAFETY- Our way of life! — WASHINGTON RIVER PROTECTION SOLUTIONS

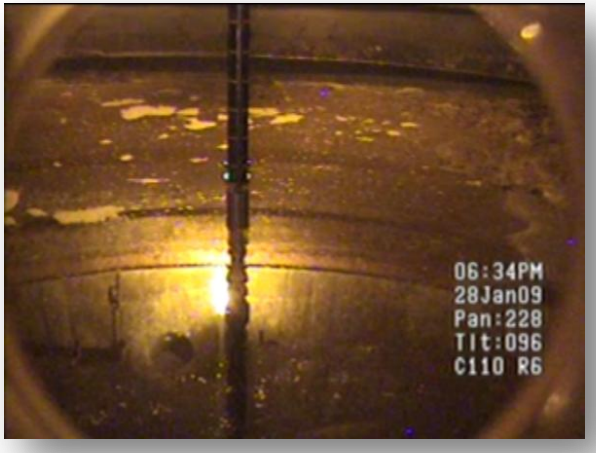
EM Environmental Management

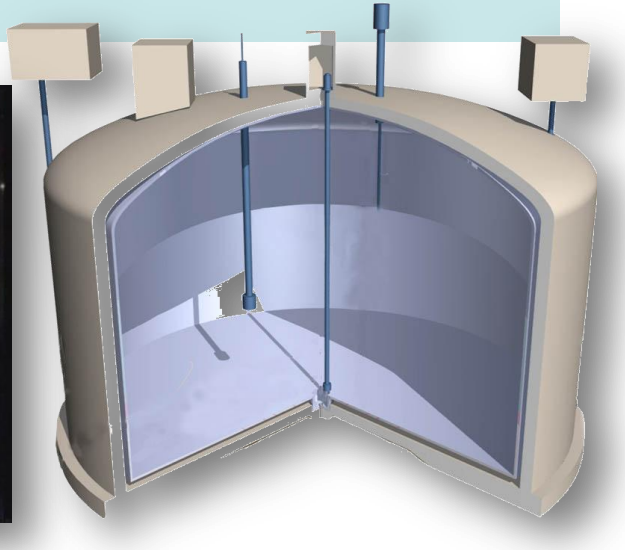
safety ❖ performance ❖ cleanup ❖ closure

www.em.doe.gov

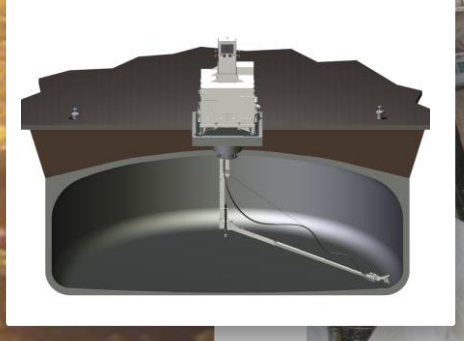
Tank Retrieval Status

- Seven single-shell tanks retrieved
  - Six meet Tri-Party Agreement retrieval requirements
  - One under review
- Four single-shell tanks at limits of technology
- Approximately 1.6 million gallons/13.7 million curies retrieved
- One single-shell tank currently being retrieved
- Next single-shell tank retrieval system under construction
- Eight retrieval technologies deployed, including MARS





Retrieval Progress Continues



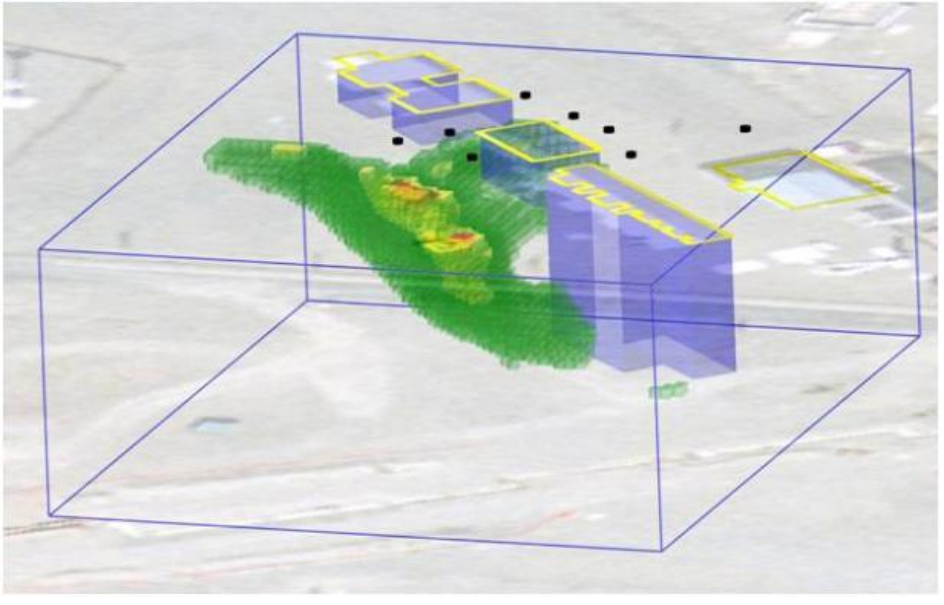
- Completed C-110 retrieval to limits of technology in FY-09
- Completed 75% retrieval of C-104 as of March 9, 2010; plan to complete to limits of technology by May 2010
- Systems installation on C-111 (30% complete as of March 15, 2010); retrieval planned to begin summer 2010
- Preparing for C-107; first to use new retrieval system (MARS); larger risers being fabricated; cutting process being tested

Waste Management: Retrieval Support, Facility Upgrades

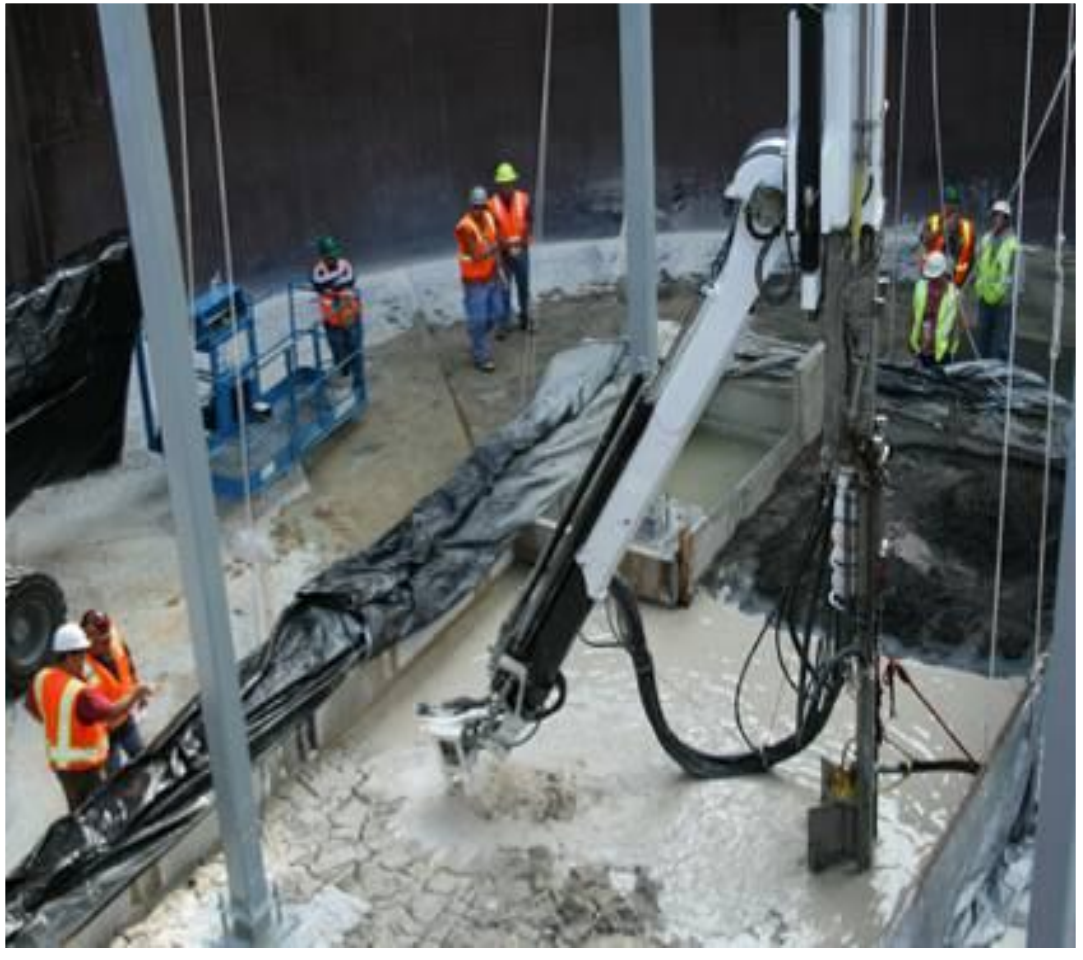
- Double-shell tank (DST) space management
  - ~900,000 gallons of liquid removed in FY-09
  - ~350,0000 gallons planned for FY-10
- Facility upgrades (RA)
  - 222-S Laboratory: analytical instrumentation, computer network, roof
  - 242-A Evaporator: raw water line, compressor

Waste Management: Environmental Protection

- Continued surface and vadose zone characterization
- Began TY tank farm barrier development
- Completed removal of legacy hose-in-hose transfer lines; Ecology commitment
- Continued tank integrity studies



Technology Deployments to Improve Project Efficiency and Reliability



- Completed design, procurement and initial testing of Mobile Arm Retrieval System (MARS)
- Developing wiped film evaporator

Preparing for Waste Treatment Plant Operations

- Performing waste feed delivery mixing and sampling demonstrations
- Increasing WTP collaboration
- Developing the next generation of workers: community college nuclear technology program

ARRA Projects Benefit TOC Mission

ARRA Project Category	Funding Level	Near/Long-term Benefits
Equipment/System/Piping Upgrades*	$180 M	*Achieves life extension and improved reliability in the tank farms and upgrades systems essential to WTP transfer.*
Technology Applications	$ 53 M	*Enables waste retrieval capabilities and prepares for waste feed delivery to the WTP.*
Facility Upgrades*	$ 81 M	*Improves reliability of aging facilities critical to consistent WTP waste feed delivery.*
Deactivation & Decommissioning	$ 8 M	*Creates safe work environment by eliminating congestion, workplace hazards, sources of contamination, and regulated materials. Allows for replacement systems to be put in place. Improves conduct of operations.*

Drawing reconstitution is included in the above work scope and accounts for approximately $10 M in ARRA funding.